Standards

As noted, the E911 technology is standards based. Applicable standards were only approved and published last year. Generally, 18 to 24 months are needed between standard adoption and development of compatible technology. As you will note from the discussion in the above section entitled "Required Components and Availability Details", Nortel Networks has bested or equaled the usual timelines for delivery of functionality after a standard is published.

Field Trial

Nortel Networks endorses an end-to-end field trial before a more extensive roll-out of the E911 technology takes place. The end-to-end field trial is important because, to address the overall goal of the delivery of location information to a PSAP, the E911 technology must successfully interwork with the E911 components supplied by other vendors as well as technologies supplied by other necessary parties, such as the location technology provider and the Local Exchange Carrier.

The successful conclusion of the trial will provide a validated solution across all necessary technologies and parties. To deploy a solution without an end-to-end field trial could lead to remedying the same issues multiple times in a serial fashion. Nortel Networks does not have the resources to deploy the E911 technology and then correct issues, that may well be identical, simultaneously. Other necessary parties, such as the location solution vendors and Local Exchange Carriers and even wireless carriers, may have similar limitations.

CALEA

Nortel Networks will make six punch list items available in generic software release MTX10. Each item will be individually toggled. As noted above, the MTX10 generic software release will become generally available in Q4 2001, shortly after the initial FCC compliance date of Sept. 30, 2001. Any hardware necessary to achieve compliance with the punch list requirements is available now.

Nortel Networks has moved diligently to develop the CALEA punch list functionality since the standards were adopted for the punch list items in April, 2000. Nortel Networks will begin trialing the CALEA software later this summer with several customers. Nortel Networks plans to test the MTX10 CALEA software with the FBI later this year.

Nortel Networks plans to shortly provide the FCC with its delivery schedule for E911 technology and the CALEA punch list functionality. The FBI will be presented with a copy of the Nortel Networks presentation for purposes of demonstrating when the punch list features will be made available. Your company may want to contact the FBI about CALEA flexible deployment in light of the availability of MTX10 after the Sept. 30 compliance date.

If you should have any questions, please contact Tony Smith, Director, Wireless Regulatory Affairs, Nortel Networks at (972) 685-8779.

Sincerely,

Steve McNitt
Director, Wireless Strategy

NORTEL NETWORKS

How the world shares ideas.

July 3, 2001

Evans Roberts
Cingular Wireless
5565 Glenridge Connector
Atlanta, GA 30342

Re: GSM based Nortel Networks E911 Phase 2 core network technology

Dear Evans,

Nortel Networks is committed to its part in enabling an end-to-end, E911 Phase 2 location information solution. As explained in this letter, Nortel Networks will supply the necessary core wireless networking technology (E911 technology) enabling wireless carriers using its DMS-MSC switch, when interworking with other parties and technologies, to convey location information to the Public Safety Answering Point (PSAP).[1] Despite diligent development efforts, the earliest potential compliance deadline of October 1, 2001 unfortunately will not permit Nortel Networks to make the entire tested, deployable E911 technology generally available at that time.[2] Only a part of the overall E911 technology will be generally available for provisioning prior to October 1, 2001. The remainder of the E911 technology will be made generally available after October 1, 2001.

Required Components and Availability Details

The E911 technology for use in connection with the DMS-MSC platform requires a combination of hardware and software which Nortel Networks has designed to operate in accordance with the E911 applicable J-STD-036 standard. The functional elements constituting the Nortel Networks E911 technology are the Serving Mobile Location Center (SMLC) releases 1.0 and 2.0, Gateway Mobile Location Center

[1] The Nortel Networks DMS-MSC switch is generally used by carriers to support the GSM wireless protocol.
[2] By generally available, Nortel Networks means that the product has been adequately tested, any corrections made and offered commercially to all carriers desiring to purchase or license the product or software.

(GMLC), the switch software and software on the RF access subsystem equipment. In order to deploy the Nortel Networks E-OTD location technology, a carrier must also install release 2.0 of the SMLC software and deploy Location Measurement Units (LMUs) with base stations.

The E911 technology elements will be made generally available by Nortel Networks according to the following schedule. Included in the table are the components necessary to support an E-OTD location solution.

Component	Role	GA Date
GSM13	Switch software	Q3 2001
V12.4+	RF access subsystem	Q4 2001
SMLC release 1.0*	NSS location solution**	Q4 2001
SMLC release 2.0	E-OTD support	Q2 2002
GMLC	PSAP Interface	Q1 2002
LMU	E-OTD support	Q2 2002

* Available in limited quantities in Q4 2001.
** NSS means Network Software Solution

This schedule represents Nortel Networks' current plan. This plan could be altered by a number of factors, including unavailability of handsets for testing and resolution of technical issues identified through interoperability testing of the E911 technology with other vendors' technology contributions.

Standards

As noted, the E911 technology is standards based. Applicable standards were only approved and published last year. Generally, 18 to 24 months are needed between standard adoption and development of compatible technology. As you will note from the table set out in the above section entitled "Required Components and Availability Details", Nortel Networks has either bested or met the usual timelines for delivery of functionality after a standard is published.

Field Trial

Nortel Networks endorses an end-to-end field trial before a more extensive roll-out of the core wireless networking technology takes place. The end-to-end field trial is important because, to address the overall goal of the delivery of location information to a PSAP, the E911 technology must successfully interwork with the E911 components supplied by other vendors as well as technologies supplied by other necessary parties, such as the location technology provider and the Local Exchange Carrier.

The successful conclusion of the trial will provide a validated solution across all necessary technologies and parties. To deploy a solution without an end-to-end field trial could lead to remedying the same issues multiple times in a serial fashion. Nortel

Networks does not have the resources to deploy the E911 technology and then correct issues, that may well be identical, simultaneously. Other necessary parties, such as the location solution vendors and Local Exchange Carriers, may have similar limitations.

Nortel Networks plans to shortly advise the FCC of its delivery schedule.

If you should have any questions, please contact Tony Smith, Director, Wireless Regulatory Affairs, Nortel Networks at (972) 685-6190.

Sincerely,

Steve McNitt
Director, Wireless Strategy

June 25, 2001

Ms. Kris Rii ne
Vice Presidc it, Technology and Product Realization
Cingular Wi eless
5565 Glen R dge Connector
Suite 930
Atlanta, GA 30342

Re: Ericsson Delivery Dates for E-911 Phase II E-OTD

Dear Ms. Rii ne,

This etter responds to your request that Ericsson provide Cingular the dates by which it can deliver its GSM locating technology in commercial quantities for use in Cingular's n :twork equipment and terminals. Ericsson believes that manufacturers, carriers and i idustry standards-setting groups have made significant progress in resolving many of the ·'ifficult technical issues relating to E-911 Phase II location technologies for network infra structure and terminals. Based on the dates by which certain standards were adopted and ·ther standards are expected to be adopted, Ericsson currently plans to have its GSM pro lucts available in commercial quantities to begin deliveries to carriers as follows:

Locating Technology	Network Equipment	Terminals
Cell Global I(entity plus Timing Advance (CGI+TA)	Q4 2001	(legacy)
Enhanced CG I+TA (E-CGI+TA)	Q1 2002	(legacy)
Enhanced Ob erved Time Difference (E-OTD)	Q1 2002	Q2 2002

The C GI+TA and E-CGI+TA locating technologies will work with all legacy standard GSM terminals. The E-OTD locating technology requires new terminals plus significant eq ipment implementation in the network.

Ericss n will have conducted interoperability testing before it ships the equipment. E icsson conducts these tests between its handset and network equipment to ensure compa ibility and compliance. During Q1 2002 Ericsson will also conduct E-OTD interope ability tests with products from other vendors to ensure compatibility and compliance.

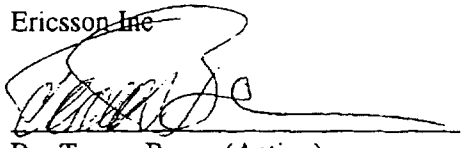
The da tes listed in the chart do not include the time that it will take carriers to rollout or laun :h the new products. Based on its experience, Ericsson believes that an E-OTD product rollout on a regional basis will take twelve months, at a minimum, to complete for existing networks. This twelve months begins from the time that commercial qu antities of E-OTD network infrastructure equipment begin shipping in Q1 2002.

ERICSSON

Pleas e let me know if we can address any further questions.

Sincerely,

Mikael Stromquist
Vice President and Chief Technical Officer
Ericsson Inc



By: Tomas Bern, (Acting)
Director, Technical Services
Ericsson Inc

EUS/RK/BB-01:073
June 27, 2001

Mr. Bobby K. Adams
Executive Director- Intelligent Networks Products and Services
Cingular Wireless
5565 Glen Ridge Connector
Suite 930
Atlanta, GA 30342

Cc:
Kris Rinne
Bill Clift
Steve Hardin

Re: Ericsson Support for MNLS Technology for E911 Phase 2 compliance

Dear Mr. Adams,

This letter responds to your request that Ericsson provide Cingular with general information regarding MNLS (Mobile Assisted Location System) positioning technology that we are developing as an alternative to support the E911 Phase 2 function.

The Ericsson MPS-T1.2 will have a general availability of Q-4-2001

The MNLS technique makes use of an existing mechanism of TDMA IS-136 and IS-54B handsets, in which the mobile handset makes measurements to assist the wireless system in determining the best cell site to handoff the mobile. In this technique, often referred to as MAHO (mobile-assisted handoff) the mobile is commanded by the wireless system to make signal strength measurements of up to 24 neighboring base stations. The mobile makes these measurements on the continually transmitting strong control channel broadcast from each base station sector to the mobile. In TDMA, the MAHO list is controlled by the operator, and makes measurement on every MAHO candidate channel regardless of signal strength. This provides a list of the broadcast power from multiple cell sectors to a mobile in its current position. Since the MAHO measurements can be made down to the minimum sensitivity level of the phone (-113 dBm), the mobile is able to "hear" sites within a large radius.

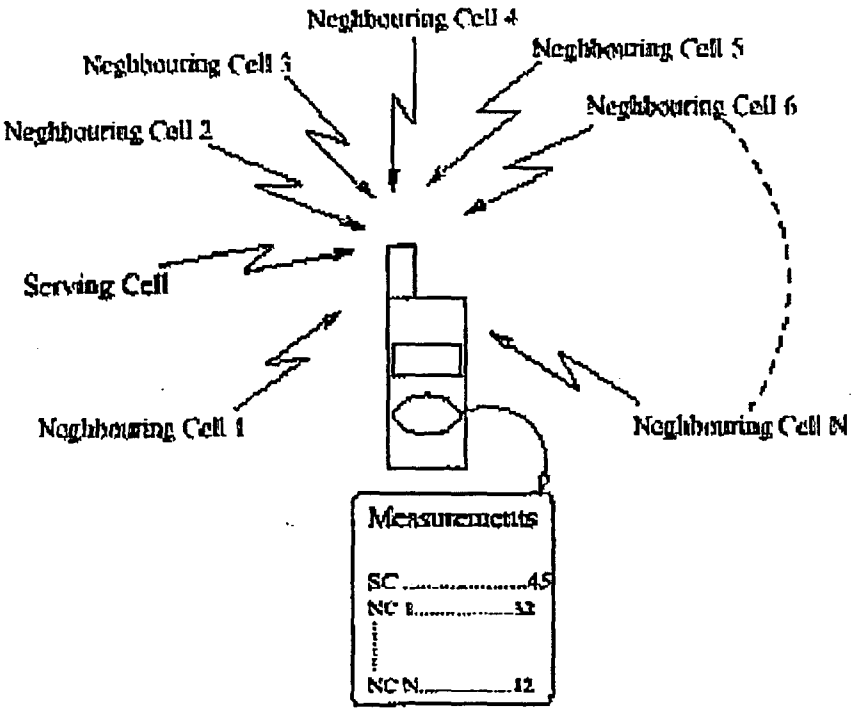


Figure 1: Mobile measures neighboring base stations signal strength

After making these signal strength measurements, the mobile will transmit these reports back to the wireless system. These reports will be sent while the 911 voice call is being setup to the PSAP. (Note: The 911 call is not held or delayed prior to call setup.) Unlike some other network solutions, an advantage of the MNLS system, is that MAHO reports are transmitted from the phone every 1 second during a TDMA call, consequently, this technology could provide the ability to track the 911 call, rather than just an initial location at call setup.

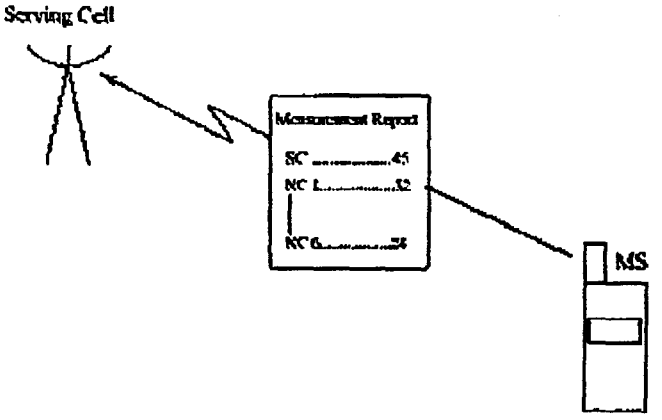


Figure 2: Mobile reports the measurements it made back to the wireless system

The MAHO lists and cell site information are delivered to a processor that can determine mobile location with either, or a combination, of two techniques: the first one called "triangulation", and the second one known as "contour matching".

In the first technique, termed "triangulation", the signal strength from multiple MAHO channels is associated to their cell site location. This then produces a geometric triangulation mathematical problem that can be solved to determine the mobile's location.

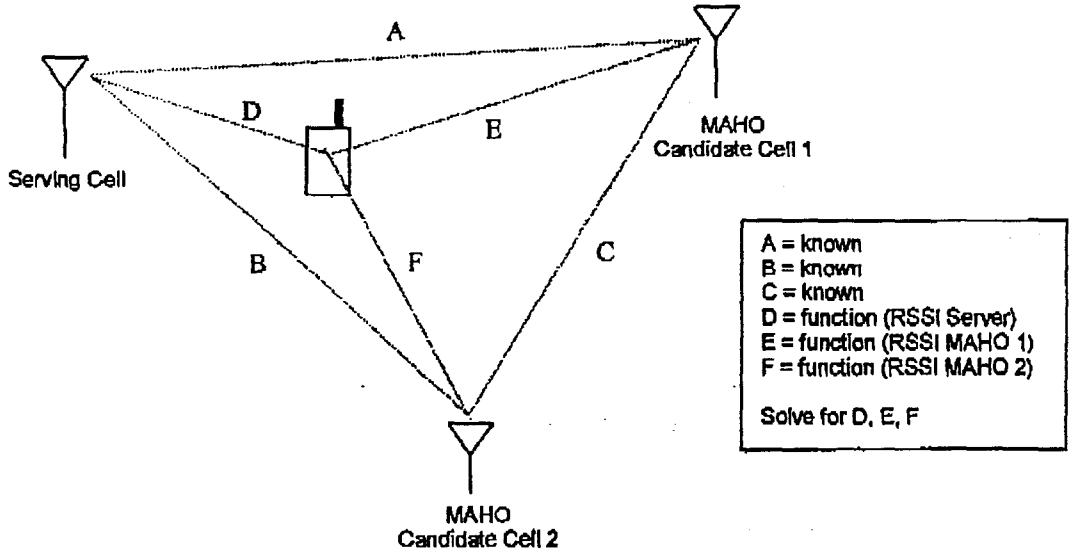


Figure 3: Example of "triangulation" to determine location, 3 sites example.

In the second technique, termed "contour matching", the wireless system receives these measurements and compares these relative signal strength measurements to a specially developed database of stored relative signal strength measurements within the cell serving the call. The wireless system will then determine the location of the mobile by matching it to one of these predetermined grid locations in the database.

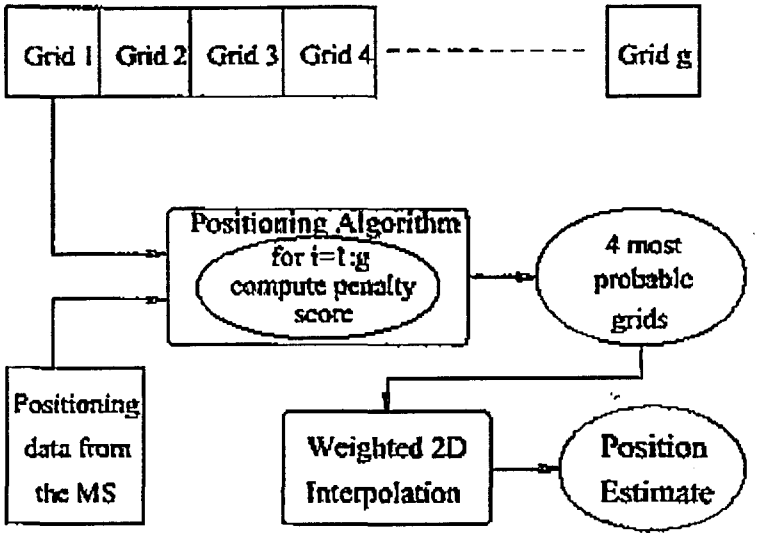


Figure 4: Wireless system determines location by matching DB grids to mobile report

The database for the grid measurements can be created in several different methods. The best method is to use available RF engineering tools to predict the expected received signal strength (RSS) measurements within grids as small as 50 meters. These engineering tools take into account antenna height and type, down-tilt, beam width, effective radiated power, and ground clutter. These predictive measurements can then also be augmented with real world measurements to increase accuracy in difficult areas.

It is possible to use both the triangulation and contour match techniques in combination. In combination, it would allow for the most flexibility.

Status of Standards Efforts:

MNLS is a fully standards-compliant solution that is currently being adopted by TR45.2 AHES (Ad-Hoc on Emergency Services), the industry-PSAP body overseeing wireless E911 standards.

Advantages:

The MNLS has many advantages over other alternate solutions investigated. These advantages include:

1. Legacy handsets – The systems works with all TDMA handsets in the ANSI-41 network. No changes, upgrades or replacements are necessary to these handsets.
2. Roaming support – MNLS will support all TDMA handsets roaming into our network.
3. Non-valid/uninitialized handsets – MNLS will support TDMA phones that do not have a valid account or phone number.
4. High Reliability – MNLS is using the same functionality normally required by the network. Therefore, if problems arise, they will be detected immediately. The integral nature of the MNLS solution to the overall network dramatically increases the reliability of the system.
5. Standards compliant – MNLS is a fully standards compliant (see above).
6. Updated Location – One of the advantages of the MNLS system is the fact that locates can be completed repeatedly on the same 911 call, in order to allow PSAPs additional information, such as direction of travel, etc.
7. Improvement – The accuracy of the system can most likely be improved with ongoing enhancements to the algorithms, and to the location grid database.
8. One of the advantages of the MNLS system is the fact that locates can be completed repeatedly on the same 911 call, in order to allow PSAPs additional information, such as direction of travel, etc.

Accuracy:

The following are the approximate accuracies expected:

All Environments	67%	95%
All Calls	Approx. 250 meters	Approx. 750 meters

Please let me know if we can address any further questions.

Sincerely,

Mikael Stromquist
Vice President and Chief Technical Officer
Ericsson

Lucent Technologies
Bell Labs Innovations

Date: July 6th, 2001

From: Dennis Mugwanya
Senior Manager
TDMA Applications
Product Management
973-884-6437

To: TDMA Service Providers

Subject: MAHO Measurement Support for E911 Phase 2 Software Feature

This letter is in regard to Request Assessment and Definition Form (RDAF) No. 012979 (Support for E911 Phase II on TDMA, received by Lucent on May 11, 2001) which requests a feature to support document J-STD-036 Addendum 2.1 (TDMA MAHO Modifications, April 10, 2001)[1]. Given the date of receipt of the RDAF and the technical complexity of the solution, this optional feature is being considered as a candidate for a future TDMA Software Release with a targeted General Availability (GA) of August 2002. This feature would address the Base Station, MSC, and interface to MPC aspects of J-STD-036 Addendum 2.1. Please note that additional network elements (e.g., MPC, PDE) needed for this E911 Phase 2 solution will not be provided by Lucent.

The estimated price and availability are intended for planning purposes only and should not be considered as either a firm price quotation or as a commitment to develop the feature. The final commitment and price will be delivered in Sept 2001. The final quoted price, could be affected by customer responses, changes in definitions requested by the customers, changes in the architecture or implementation of the actual product and any further changes to J-STD-036.

Before we can continue, we will need a formal response from the TDMA customers indicating continued interest to proceed. Acceptance of a final Lucent offer will require that the requesting customer become the FOA customer for this feature. Failure of a Lucent TDMA customer to respond in a timely manner may delay the targeted General Availability date for this feature.

Sincerely,

Mark Paletta for Dennis Mugwanya

Dennis Mugwanya
Senior Manager
TDMA Applications Product Management

[1] This document has not yet been balloted, or approved, for acceptance as a TIA standard.

CERTIFICATE OF SERVICE

I, Stephanie Schmeider, do hereby certify that on this 6th day of July 2001, a copy of the foregoing Petition for Waiver was served by hand delivery on the following parties:

Commissioner Kevin J. Martin
Federal Communications Commission
445 Twelfth Street, S.W. Room 8-C302
Washington, DC 20554

James D. Schlicting
Wireless Telecommunications Bureau
Federal Communications Commission
445 Twelfth Street, S.W. Room 3-C207
Washington, DC 20554

Peter A. Tenhula
Senior Legal Adviser
Office of Chairman Powell
Federal Communications Commission
445 Twelfth Street, S.W. Room 8-A204
Washington, DC 20554

Gerald P. Vaughan
Wireless Telecommunications Bureau
Federal Communications Commission
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S. Schmeider
Stephanie Schmeider